

## TISSUE DISTRACTION DEVICE

is a continuation of application number 09/872,905, filed June 1, 2001, now US Patent No. 6,595,998 B2, which

This application claims the benefit of priority to United States Provisional Application number

09/872,905, filed March 8, 2001.

### Field of the Invention

The present invention involves the field of surgery, and particularly surgical instruments and methods of using the same.

### Background of the Invention

A variety of physical conditions involve two tissue surfaces that, for treatment of the condition, need to be distracted from one another and then supported away from one another. Such distraction may be to gain exposure to select tissue structures, to apply a therapeutic pressure to select tissues, to return tissue structures to their anatomic position and form, or in some cases to deliver a drug or growth factor to alter, influence or deter further growth of select tissues. Depending on the condition being treated, the tissue surfaces may be opposed or contiguous and may be bone, skin, soft tissue, or a combination thereof. An optimal treatment method includes distracting and supporting the tissue surfaces simultaneously.

A minimally invasive distraction and support device would have significant application in orthopaedic surgical procedures, including acute and elective procedures to treat bone fractures and degenerative changes of the skeletal system and including vertebral compression fractures, interbody fusion, vertebral disc augmentation or replacement, and other compression fractures including, but not limited to tibial plateau compression fractures, calcaneous compression fractures, distal tibia fractures, distal radius (wrist) fractures, crushed or fractured orbit and orthopaedic oncology. Further, a minimally invasive distraction and support device would have application in non-orthopaedic surgical procedures in plastic surgery (for example facial reconstruction), gastrointestinal surgery and urological surgery (for example the treatment of incontinence).

### **Vertebral Compression Fractures**

A vertebral compression fracture is a crushing injury to one or more vertebrae. Vertebral fractures are generally associated with osteoporosis (the "brittle bone" disease), metastasis, and/or trauma. Osteoporosis reduces bone density, thereby weakening bones and predisposing them to fracture.

The osteoporosis-weakened bones can collapse during normal activity. In severe cases of osteoporosis, actions as simple as bending forward can be enough to cause a vertebral compression